MARINE REVIEW.

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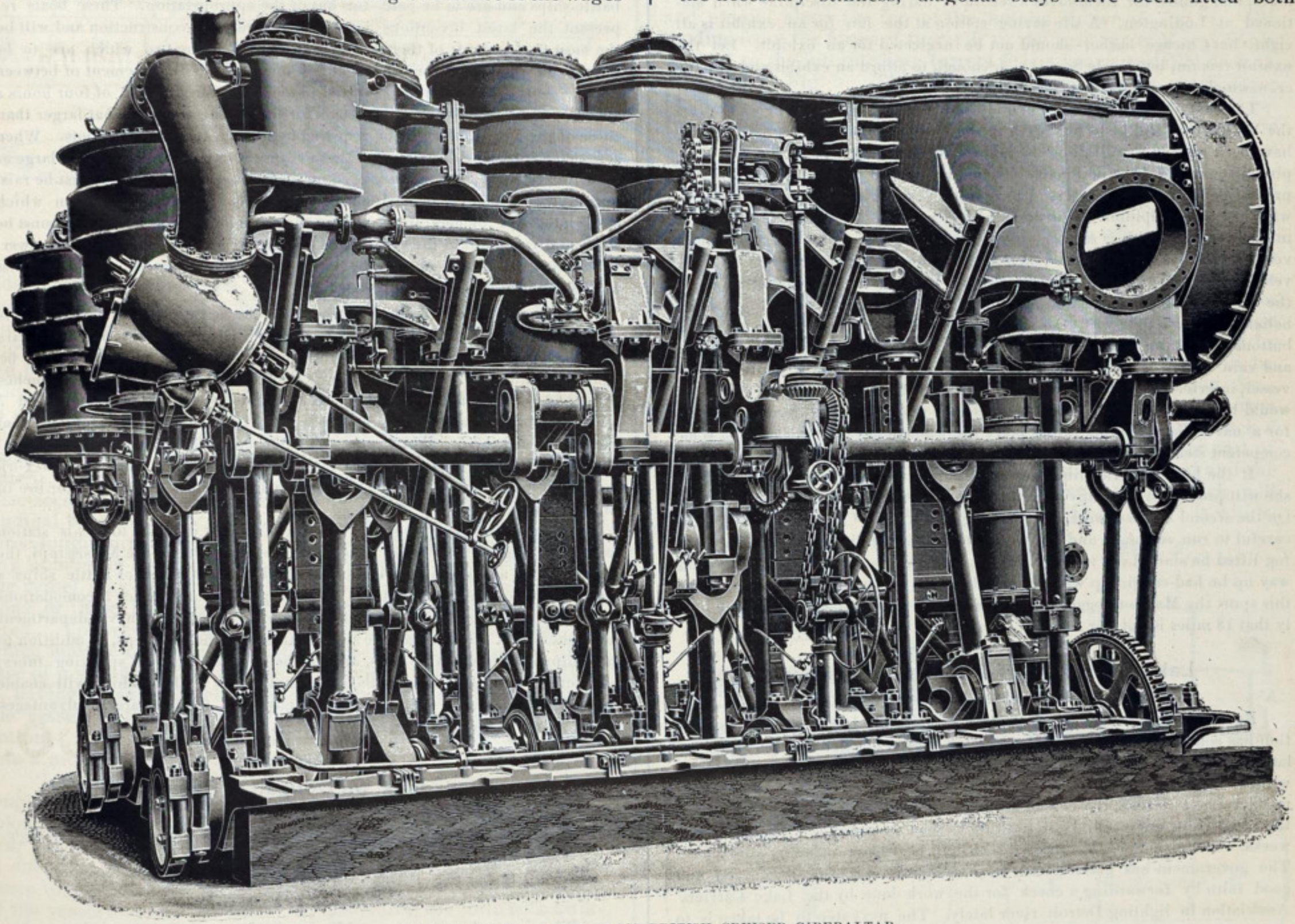
A View of the Depressed Freight Market.

For seven years, since 1886, when the construction of steel freight vessels was actively begun in different parts of the lakes, vessel owners have been favored with a constant demand for tonnage at profitable rates, and at no time during this long period of prosperity, excepting for two or three months in the early part of 1891, has there been any decided reaction from excessive production of tonnage in the ship yards, although it has been shown, on numerous occasions, that the fleet of freight vessels has more than trebled itself within these few years. There has not been up to this time a single instance of the wages of employes being reduced after they were established in the spring, but the exigencies of the present situation will result in more careful and economical methods among managers, if it does not, in fact, upon a continuance of present conditions, cause a great deal of floating property to be laid up. The hope that the money disturbance is still at the bottom of the present depression is, however, a great incentive to keeping vessels in commission, and there is also encouragement in the large amount of business being done, notwithstanding the low freight rates. Among the iron ore dealers, who have lived up to heavy freight contracts made in the spring, there has been an increase in the number of wild charters made during the past few days, but the rates are, of course, very much below the profit basis and are accepted only with a view to bridging over a waiting period.

Engines of a First-Class British Cruiser.

The engraving on this page represents engines of the first-class twin-screw cruiser Gibraltar of the British navy. The engines are of the triple compound inverted vertical type. The high pressure cylinder is in each engine 40 inches in diameter, the intermediate 59 inches and the low pressure 88 inches, the stroke in each case being 61 inches. The high pressure cylinders have piston valves, while the intermediate and low pressure cylinders have slide valves. The cylinders are supported from the cast steel bed plate by wrought iron columns, while to insure the necessary stiffness, diagonal stays have been fitted both longitudinally and transversely. The open design permits of ready access to all working parts, and as the air pumps are suspended from the low pressure cylinders and worked off the low pressure pistons, there is no appearance of overcrowding about the starting platforms. The air pumps are single acting, the cylinders being 24 inches in diameter and 51 inches stroke. Steel has been largely used in construction. The connecting rods are 8 feet centers, while the piston rods are 8¼ inches in diameter. The crank and propeller shafts are of forged steel and hollow, the external diameter being 15¾ inches, and the internal diameter 8½ inches. The propellers are 16 feet diameter, and the mean pitch 23 feet 3 inches. The propellers are entirely of gun metal, each having three blades. The engraving and description are from Engineering of London.



ENGINES OF THE FIRST-CLASS BRITISH CRUISER GIBERALTAR.

Inadequate Service from Life Savers—Chicago Matters.

WESTERN OFFICE, MARINE REVIEW,
No. 701 Phoenix Building, CHICAGO, Ill., July 13.

The feeling of indignation against the life saving service for abandoning the station at the mouth of the river and placing the crew at the fair grounds, is very warm now, since so many lives were lost Sunday in the big squall. Marine men generally, as well as those who are interested in aquatic sports and yacht owners, make no bones about terming this action of the life saving officials a piece of gross negligence. Of course it is the yachting and boating interest that is best protected by the life crew at this station, for the lake is scoured so thoroughly by tugs from the harbor north to Racine and Milwaukee, in search of tows, that accidents to the larger craft are very infrequent. Yachtsmen, however, hold that the whole of Chicago's water front from the fair grounds to Evanston is absolutely unprotected by life savers. This is about fifteen miles of shore line. Had not the tug Tarrant of the Dunham line been sent out from the harbor just after the squall last Sunday, on a search for capsized craft, at least two more victims would have been added to the list of dead in the Chesapeake horror. As it was they were in the water over an hour and a half, and it is extremely doubtful if the life saving crew at the fair grounds knew of the accident until the daily papers were read the next morning. No blame shonld be attached to the life savers. The crew is well known on the lakes, and gained for themselves a record of daring and discipline when stationed at Ludington. A life saving station at the fair for an exhibit is all right, but Chicago harbor should not be neglected for an exhibit. Let the exhibit remain, but Uncle Sam is rich enough to afford an exhibit and also the crew which is so necessary at the harbor.

The caravels are here all safe, and by the time the REVIEW goes to press the Viking ship will be at her berth in the south lagoon at the big fair. They have been written up all along the lakes, and anything here at the last stopping place would be superfluous. They serve a good purpose in teaching the present generation the dangers of navigation years ago. Marine men have always had a poor opinion of the navy, and vice versa. Perhaps both are right in some things, but it is safe to assert that almost any captain of a merchant vessel on the lakes could have taken hold of the naval parade when the caravels arrived and handled it in better shape than it was under the direction of the old relics, the Johnson and Michigan. Vessel captains are inclined to the belief that the trouble with the whole thing was too much gold lace and brass buttons aboard the Michigan and Johnson, and that the indispensable pomp and vain glory, with the usual red tape which prevails on a United States vessel, interfered materially with the display, and delayed it several hours. It would be well to give the other side a chance now, and when there is occasion for a naval display in the future place the whole affair in the charge of some competent steamboat captain, and let him show what he can do.

If the Lake Superior line steamer Manitou goes on in her present style, she will prove fast company for any of the "flyers" that may fall in with her. On the second trip last week she was caught in a fog. Capt. McIntyre was too careful to run very fast, and consequently lost about nine hours. When the fog lifted he started out to make this up, and when he passed Mackinaw on his way up he had caught up with the schedule and was running on time. During this spurt the Manitou logged 17 miles an hour, and her owners say confidently that 18 miles is not her limit.

Lake Carriers' Affairs—Buffalo Gossip.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., July 13.—Secretary Keep of the Lake Carriers' Association has concluded not to go to Washington, as was decided upon at Cleveland lately. The Detroit river lights are likely to be kept up by the government without any further effort. A communication to him this week from Commander Jas. P. Green, the new light-house inspector of this district, states that the Lime-Kiln lights will be in position as soon as possible, probably in two weeks. The placing of the Ballard reef light is already officially announced. The government has given a still more substantial proof of its activity and good faith by forwarding a check for the work done by the Lake Carriers' Association in lighting Detroit river lately. The next step to be taken is to prepare for the extra session of Congress. This body will have its committees in operation next month, and the departments are going to hand in their estimates. Secretary Keep will prepare a statement, addressed to the light-house board, of the lights that are deemed most important, so that it can work intelligently.

It will have to be admitted for the first time that Buffalo begins to share in the general depression that has overtaken the lake trade. There is no more than an indication as yet, for more than an average amount of grain was received and coal shipped last week, but coal shippers begin to hold back now. Boats are laying up in Tonawanda, unable to find lumber to carry. Vessel men say it never looked worse, not because they find loads hard to get, but because they see no relief ahead. For this reason they are likely to die easy. Tying up will be common in ten days unless there is a change for the better.

The canal did remarkably well last week with a break of several days on hand. The superintendent of public works hustled the repairs forward and the freights advanced. Wheat is moving by canal at 4¾ cents to New York, a rate seldom reached in mid-summer. Were it safe to reckon on any such rate hereafter, or were it certain that the railroads had concluded to stop cutting summer rates on grain down to nothing, there would be a big fleet of canal boats built this winter. But the low rates have been the rule so long that boatmen are not only poor but very cautious.

Though Gen. Poe is reported as quite well satisfied with the deep channel work, it is none the less known that the Bar point contract is not progressing very favorably, and it is said that the Smiths would be glad to give up their job for some reason.

Small Boats on Big Ships of War.

Special Correspondence to the MARINE REVIEW.

WASHINGTON, D. C., July 13—There is one feature of naval construction which has been so overshadowed by the building of huge warships of the new navy that the public has entirely lost sight of it. That is the building of the small boats which nowadays are an essential part of the armement of a ship of war. With the introduction of the torpedo, small craft for their use have become necessary, and our naval officials in designing them have fully kept pace with the ingenuity displayed in building the large vessels. The battle-ships Maine and Texas are to be equipped with two torpedo boats each, which are now under construction. They were included in the plans of the battle-ships and are to be paid for out of the appropriation. These boats represent the latest inventions in marine engines and construction and will be the most perfect craft of their kind in the world. The two which are to be placed on the Texas are about 60 feet long, with a displacement of between 7 and 8 tons. They will be required to maintain for a period of four hours a speed of 17 knots an hour. The boats for the Maine are somewhat larger than those of the Texas, and will be required to attain a speed of 18 knots. When it is taken into consideration that these adjuncts to the vessel, each as large as an ordinary yacht, are to be stowed on deck when not in use and must be raised and lowered whenever needed, an idea may be gained of the problem which confronted the officers in designing them. The lightest machinery must be used, and yet to attain the great speed required must be exceedingly powerful. They will be armed with the latest torpedo appliances, the Hotchkiss and Whitehead torpedoes being used.

Another novel craft is the electric gig of the new cruiser New York. It is the first electrically propelled ship's boat ever used in our navy, and if it bears out the claims of the builders it is probable that all of the new ships will be similarly equipped. The New York's launch is 30 feet long, 6 feet 10 inches beam and has a draft of 22 inches. Her estimated speed is between 6 and 7 knots an hour on a sustained run of five or six hours, though it is claimed that she can exceed this in short runs. The Grand Duke Nicholas was so impressed with one of these electric launches which he saw while in New York during the naval review that it is said a pair of them were ordered for use in the Russian navy.

Following the example set by Admiral Farragut when he took his station in the rigging of his vessel when running the forts on the Mississippi, the French naval architects have embodied in their latest plans for battle ships a system of protected tops that will afford a position of superior accomodations to the commanding officers. Details that have reached the navy department here show that these minature steel fortresses at the mast tops, in addition to an equippment of machine guns, are now being fitted out with speaking tubes, connections with the engine bells, and fianally with a wheel which will enable the officer in the top to steer from that position. Great strategic advantages are supposed to be made available from this arrangement.

Capt. Alex. McDougall's Patents.*

STEAM PASSENGER BOAT—SPECIFICATION FORMING PART OF LETTERS PATENT NO. 500,411—DATED JUNE 27, 1893—APPLICATION FILED MARCH 23, 1891—SERIAL NO. 386,167—NO MODEL.

The inventor says: "My invention relates to various new and useful improvements in steam passenger vessels, and the invention is intended to be an improvement upon the steamboat invented by me and described and claimed in letters patent of the United States No. 429,467, and dated June 3, 1890. From an inspection of said patent, it will be seen that the vessel embraced therein consists of a metallic hull having straight sides, with a curved top and bottom, with a spoon shaped bow and skeged stern, with a short cabin, supported upon turrets, near the stern of the vessel, and with a working deck supported upon a single turret near the bow. Such a steamboat, as mentioned in said patent, was intended principally for the transportation of freight. The vessel which is to be described in this specification is intended principally for the transportation of passengers, but the hull, or hold, of the vessel may be used for carrying freight, or

*Under this heading we will publish specifications accompanying letters patent granted to Alexander McDougall since his first application for a patent on the whale-back type of vessel, May 1, 1880.

for receiving the baggage and other appurtenances of passengers. The principal object of the invention is to provide a passenger vessel, having large, commodious and airy cabins; which will be very speedy under steam, and which will be practically unsinkable. The principal novelties of the invention consist of a metallic hull, made of substantially the same shape as that described in said letters patent, but with longer and finer lines, and a cabin mounted above the hull on preferably three rows of turrets, and extending almost the entire length thereof, in such a manner as to effectively strengthen and brace the hull against lateral strains, as will be described hereinafter. Figure 1, is a

Fig. 1.

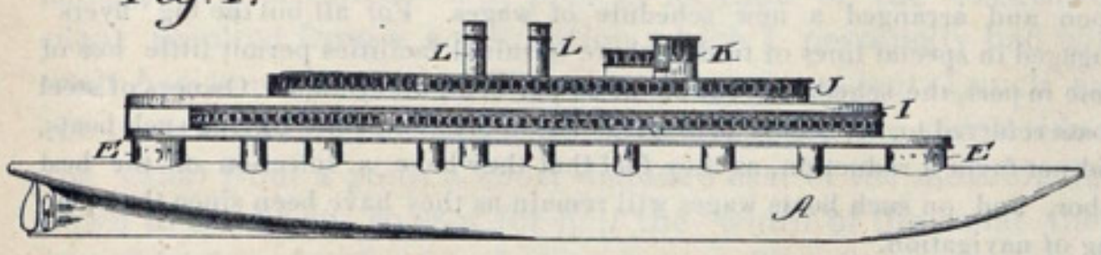
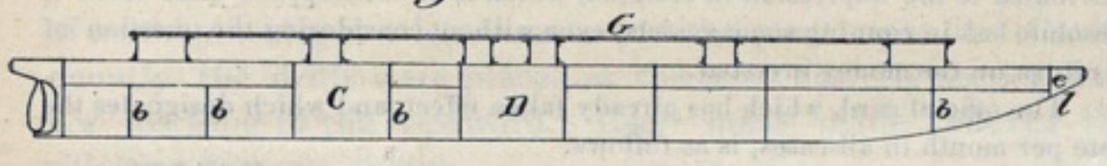


Fig. 2.



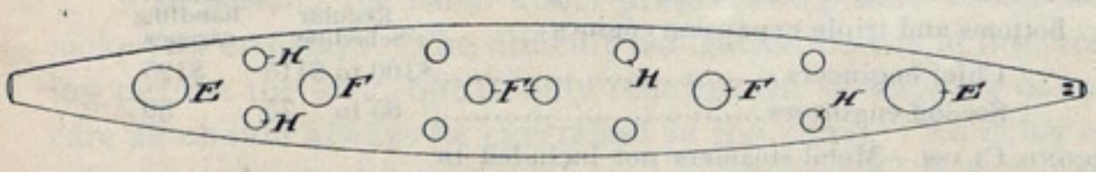


Fig. 3.

side elevation of the vessel; Fig. 2, a longitudinal sectional view, showing the cabin and engines removed; Fig. 3, a plan view of the hull with the cabin removed; Fig. 4, a front elevation, and Fig. 5, a cross sectional view. Corresponding parts are designated by the same letters of reference. A is the hull of the vessel. This hull is made substantially like that described and claimed in said letters patent, with a curved top, or deck, straight sides, and curved bottom, with a long spoon-shaped bow, and a cut-away or skeged stern. This hull, as described in said letters patent, is to be made preferably of metal plates, riveted or otherwise secured to transverse ribs. The hull is provided with longitudinal bulkheads *a a*, so as to divide the vessel into preferably three longitudinal sections. It will be understood, however, that any number of longitudinal bulkheads may be provided and that the vessel may be divided into any number of longitudinal sections, or these bulkheads may be dispensed with entirely, if desired. The vessel is also provided with cross bulkheads *b b*, which may be of any appropriate number. This vessel, as in the case of my improved tow boats, is provided with a water bottom B, having a heavy metallic top *c*, which forms a false bottom for the vessel. The longitudinal bulkheads extend from this false bottom *c*, directly to the top of the vessel, so as to divide the hull into a number of air-tight chambers.

"I am aware that it is not new to provide a vessel with both longitudinal and cross bulkheads, but these bulkheads have heretofore extended only from the bottom of the vessel to a point near the water line, so that if the vessel is damaged so as to fill at one side, or in case of a collision is rolled a considerable distance to one side, the water will be allowed to flow over the top of the vessel and into the hull. By providing the hull with bulkheads which extend directly from the top to the bottom of the vessel, no water will be allowed to enter the vessel, in case it is thrown out of its equilibrium. A very desirable arrangement of these bulkheads is to provide the hull with two longitudinal bulkheads *a a*, running along the main portion of the hull to the extreme forward and rear cross bulkheads, so as to divide the hull into three parts at its main portion and to provide a single bulkhead running from the said cross bulkheads to or near the bow and stern, so as to divide these portions into one or two parts. *d* represents a horizontal deck, situated some distance beneath the top of the vessel and extending preferably from one extreme cross bulkhead to the other extreme cross bulkhead, except at the boiler and engine rooms, but it should be understood that this deck may extend a shorter distance or that it may extend from one end of the vessel to the other. Upon this deck are placed the second class cabins of the vessel and also the quarters for the crew, &c. C D, are the engine and boiler rooms. The engines and boilers may be of any approved construction and may be of any number. I prefer, however, to place an engine in each longitudinal compartment, so that three screws may be operated.

"In the drawings I have shown only one screw or propeller, as indicated in Fig. 1, and if need be only one screw may be used, but I prefer to use two or three screws, with preferably a large screw in the center and smaller screws on either side placed forward of the large screw. At the forward part of the vessel the cross bulkheads *b b* extend from the false bottom *c*, to the deck *d*, as shown. But it will be understood that these cross bulkheads may extend at all points the entire depth of the hull, or that they may extend from the false bottom *c* to the deck *d*. As in the case of the vessel referred to in said letters patent, the present boat is provided at its extreme bow with a collision chamber *e*, so that in case the bow is damaged so as to admit water the collision chamber only will be filled. Near the bow and stern are placed two large metallic turrets E E, which are firmly riveted or otherwise secured to the top of the hull or upper deck. The forward turret E is preferably of an oval shape, in order that it may conform to the shape of the bow, and the after turret E is preferably of the same shape, but an elliptical shape would answer. Smaller turrets F F are centrally located in line with the turrets E E and extend along the top of the hull as shown in Fig. 3. Extending from the forward turret E to the rear turret E and firmly secured to the intermediate turrets F is a heavy metallic deck G, as shown in Fig. 2. This deck is supported at its outer edges upon the smaller turrets H H, which are arranged in pairs between the turrets F F. It will be seen that the deck G acts in precisely the same way as the chord of an ordinary truss, so that the hull will be effectually protected against lateral strains.

"Secured to the top of the metallic deck G are the cabins I J, which are to be of any suitable arrangement. Secured to the top of the cabin J is the pilot house K, within which is placed the usual steering gear. Smoke stacks L L from the boilers pass up through the central turrets F F, so as to be protected from the action of the waves, which sometimes pass over the lower part of the vessel. The hull is reached from the cabin I, through suitable stair-cases within the turrets. It will be evident that by mounting the cabin on turrets as I have described they will be free from all odors of bilge water, oil, machinery, cooking, &c., and will be always cool and airy, It will be observed also from an inspection of Fig. 5 that the top of the boat and the deck *d* constitute an arch and truss which will render the upper part of the vessel very strong, and that the bottom of the vessel and the false bottom *c* constitute another arch and truss which will also strengthen the bottom of the vessel. From Fig. 2 it will be

Fig. 4.

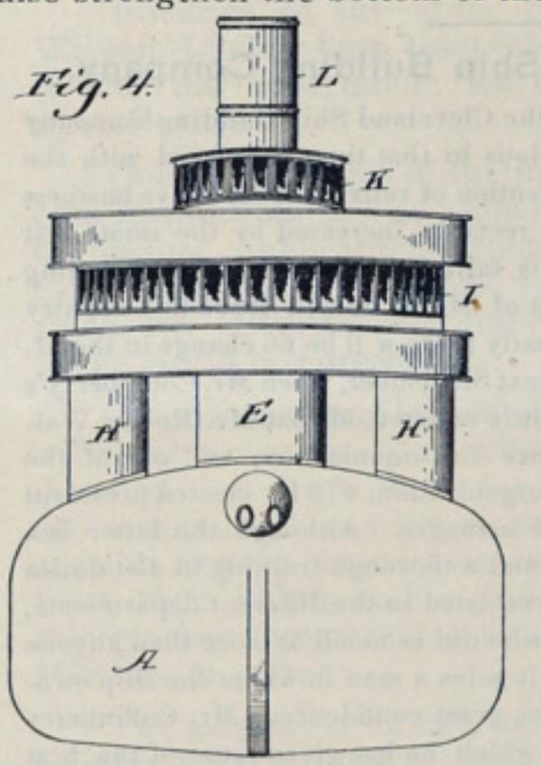
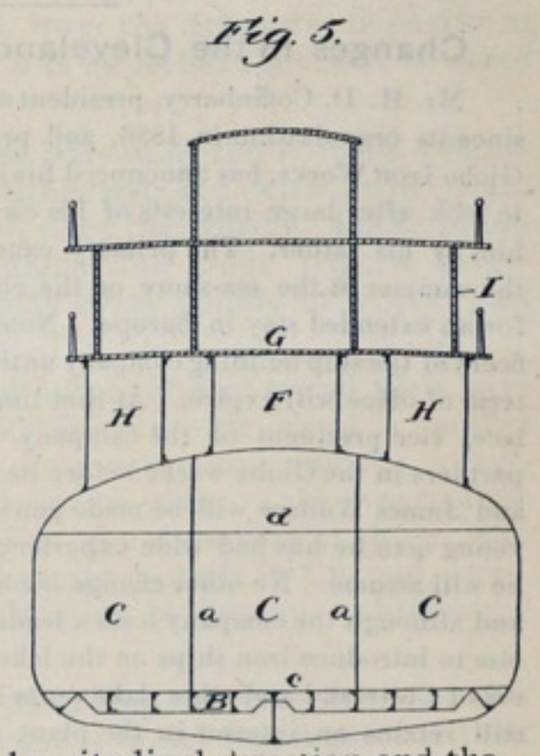


Fig. 5.



seen that the top of the vessel in a longitudinal direction and the deck G constitute a double or parallel truss which strengthens the vessel longitudinally.

"What I claim as new is as follows: First—In a vessel, a hull having an arched top and an arched bottom; with a deck *d* forming the chord or base of the arched top; a false bottom *c* forming the chord or base of the arched bottom; and longitudinal and cross bulkheads *a* and *b* extending from the top of the hull to the said false bottom, substantially as set forth. Second—In a vessel, the combination with a hull, having an arched top and an arched bottom; with a deck *d* forming the chord or base of said arched top; a false bottom *c* forming the chord or base of said arched bottom; and longitudinal and cross bulkheads *a* and *b* extending from the top of the hull to said false bottom; of a deck G, mounted above the hull on turrets, and cabins I and J, mounted on said deck, substantially as set forth."

Coal and Ore Shipments are Heavier than was Expected.

Although the movement of freight of all kinds to and from Lake Superior through St. Mary's Falls canal, up to July 1 of this season, shows a shortage of 904,846 net tons, or about 26 per cent., as compared with last season, the shipments of coal and ore were very much increased during June and the figures on these commodities now compare very favorably with those of July 1 a year ago. During June of this year the coal shipments westward through the canal foot up 492,397 tons, against 462,564 tons in June 1892, while the shipments of ore eastward during the month were 803,814 tons, against 800,965 tons in 1892. The total movement of coal and ore to July 1 of both years is shown in the following table:

	Coal up, net tons.	Ore down, net tons.
July 1, 1892	1,015,788	1,323,791
July 1, 1893	883,189	1,091,466
Shortage	132,599	232,225

Again it is evident that the coal shortage is altogether in soft coal. Shipments of hard coal from Buffalo to all upper lake ports on July 1 of this year were 183,087tons in excess of the shipments on July 1, 1892, so that it is about certain that the hard coal movement through the canal is greater than it was a year ago, and the shortage in soft coal is really more than 132,599 tons, the total shortage shown for both kinds of coal in the canal figures, which are not separated.

Freight of all kinds passing through the canal during the month of June, 1893, aggregated 1,921,095 net tons, of which 1,383,178 tons were east bound and 537,917 tons west bound. The traffic was divided as follows:

	East Bound	West Bound
Coal	.....	492,397 tons.
Flour	1,098,429 bbls.	250 bbls.
Grain	.....	.....
Corn	521,105 bu.	.....
Wheat	8,145,116 bu.	.....
Building stone	3,744 tons	.....
Copper	16,651 tons	.....
Manufactured iron	.....	5,637 tons.
Iron ore	803,814 tons	.....
Iron, pig	2,988 tons	.....
Salt	.....	36,560 bbls.
Lumber	101,354 M. feet	.....
Silver ore	415 tons	.....
Unclassified freight	22,342 tons	34,395 tons.
Passengers	1,286	1,412

Shipments of freight of all kinds through the canal from the opening this season to July 1 aggregated 2,558,078 net tons as against 3,463,924 net tons on the same date last year. Part of the shortage in the general movement of freight, as well as in coal and ore, is of course due to the late opening of the canal this season.

Changes in the Cleveland Ship Building Company.

Mr. H. D. Coffinberry, president of the Cleveland Ship Building Company since its organization in 1886, and previous to that time connected with the Globe Iron Works, has announced his intention of retiring from active business to look after large interests of his own, recently increased by the estate left him by his father. The primary cause is failing health, and after spending the summer at the sea-shore on the coast of Maine he will leave this country for an extended stay in Europe. Nominally there w ll be no change in the officers of the ship building company until next September, when Mr. Coffinberry's term of office will expire. At that time it is understood that Mr. Robert Wallace, vice president of the company since its organization, and one of the partners in the Globe works before its reorganization, will be elected president and James Wallace will be made general manager. Although the latter is a young man he has had wide experience and a thorough training in the duties he will assume. No other change is contemplated in the different departments, and although the company loses a leader who did as much or more than anyone else to introduce iron ships on the lakes, it gains a man in whom the ship owners of Cleveland and other lake ports have great confidence. Mr. Coffinberry still retains an interest in the plant to which he has given some of the best years of his life.

There is hardly any need of stating that the change in the company is made with the best of feeling and nothing but the failing health of the president could have brought it about. Enough of Mr. Coffinberry's interest was purchased by Mr. Wallace to give him a controlling interest in the plant, which for its size and capacity can be worked as economically as any on the lakes.

Mr. James Wallace, who will be the general manager of the company returned from a trip east this week, the primary object of which was some business in connection with the delivery of machinery. It is thought he would have brought home contracts for a couple of steel vessels if the condition of finances had been a little more promising.

Mr. H. D. Coffinberry, who retires permanently from lake ship building, was born at Maumee City, O., in 1841 and in 1855 came to Cleveland and began sailing the lakes. A few years later he enlisted as a seaman on the U. S. S. Michigan and was transferred to the Mississippi squadron, where he was made mate of the Louisville. While acting as signal officer in the Fort Hindman engagement he gained the title of ensign, and was finally made commanding officer of the Louisville. In 18 5 he engaged in the machinery business, later becoming connected with the Globe Iron Works. Some seven years ago the Globe Iron Works dissolved and Mr. Coffinberry with Mr. Wallace established the Cleveland Ship Building Company, which has built nineteen steel vessels, the Yuma, which is No. 18 in the list, being among the most economical cargo carriers for her size turned out this season.

Reduced Schedule of Wages.

As has been expected, the Cleveland managers of the Lake Carriers' Association met in open session in the offiice of President Wilson Monday afternoon and arranged a new schedule of wages. For all but the big "flyers" engaged in special lines of trade, where terminal facilities permit little loss of time in port, the schedule is cut about 20 per cent, all around. Owners of steel boats referred to, especially managers of iron ore companies having such boats, did not favor a reduction, as they feel that they have a selection of the best labor, and on such boats wages will remain as they have been since the opening of navigation.

With owners who advocated the reduction, the cause is, of course, entirely attributed to the depression in freights, which is so widespread that there is absolute loss in running some vessels, even without considering the question of a return on the money invested.

The official card, which has already taken effect, and which designates the rate per month in all cases, is as follows:

	Regular Schedule.	Metal boats with special facilities for handling cargoes.
FIRST CLASS.—Metal steamers having water bottoms and triple expansion engines:		
Chief engineers	$100 to $115	$125
Second engineers	65 to 75	80
SECOND CLASS.—Metal steamers not included in Class 1, and wooden vessels with triple expansion and with compound engines, except the smaller boats which may be put in Class 3.		
Chief engineers	$ 90 to $100	$115
Second "	60 to 70	75
THIRD CLASS.—Smaller boats with high pressure or low pressure engines, or with compound engines, covering all boats not included in the two former classes:—		
Chief engineer	$ 70 to $ 90	
Second "	55 to 60	
First mates	60 to 70	$ 80.00
Second " (when carried)	40 to 45	60.00
Cooks	40 to 45	55.00
Helpers	15 to 15	20.00
Firemen	25 to 30	37.50
Wheelsmen	25 to 30	37.50
Lookout	25 to 30	37.50
Deck hands	15 to 15	20.00
Oilers (when carried)	30	37.50
Firemen, when fitting out and laying up, $1.25 per day without board.		
CONSORTS AND SAILING VESSELS.		
First mates	$40.00 to 55.00	
Second " (when carried)	30.00 to 40.00	
Cooks	25.00 to 30.00	
Seamen	25.00 to 30.00	
Boys	15.00	

The term "if carried" in connection with the wages of second mates and oilers is prompted by the action of two or three owners who have already dispensed with help of this kind on most of their boats.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on July 8, 1893:

	Wheat, bu.	Corn, bu.
Chicago	19,376,000	2,085,000
Duluth	5.310,000	.....
Milwaukee	1,447,000	8,000
Detroit	1,026,000	5,000
Toledo	1,884,000	183,000
Buffalo	2,449,000	776,000
Total	31,492,000	3,057,000

At the points named there is a net decrease for the week of 445,000 bushels of wheat and a net increase of 122,000 bushels of corn.

Subscribers will avoid danger of mistakes by giving the old as well as the new address when a change is desired.

Excavating Work at the Sault.

In writing to the Lake Carriers' Association regarding complaints from vessel masters about difficulties and delays in consequence of the manner in which dredging is being done at St. Mary's Falls canal, Gen. Poe says:

"That the difficulty of navigating the canal is increased by our operations in progress for the deepening of the prism is true, but I doubt if any delays arise from that cause. The conditions are such, however, that I do not see how the diffiiculty can be immediately obviated. The present location of the excavating plant resulted from a consultation which I personally had with with Assistant Engineer Wheeler, Superintendent Lynch and the contractor. The fact is, we have deepened the north side of the canal from a point a short distance east of the movable dam down to the basin, so that for half the width of the canal there is now a clear depth of 20 feet or more. The deepening of the south half is the work now in hand. I do not know of any way of accomplishing it other than to put the plant upon it. Consequently the drills were placed at the most easterly section, and are working to the westward. Each move made relieves the situation to some extent.

"In passing the canal under present conditions vessels must make two crossings. The difficult navigation occurs at the crossing nearest the lock, but it only requires the observance of such care as should always be excercised in the canal. No delay can arise from the dredging operations, because vessels bound down are, and for years have been required to come to a full stop against the south pier, 400 feet above the lock. If the lock is clear they then move into it, otherwise they wait until the lock is ready for them. The dredging has nothing to do with this regulation, which has for its object to insure safe ingress to and exit from the lock. At present there is room east of the dredge for vessels for one lockage. As soon as these enter the lock, other vessels take their place at the pier, and so the operation continues. Upward bound vessels move right out as they always have done, and their course is not changed. For the foregoing reasons it is difficult to see how the dredging operations can cause any delay.

" One of two things is imperative—either the dredge must be withdrawn and the work of deepening the canal be abandoned, or the vessels must be subjected to the temporary inconvenience, (not delay). I fancy that no one would consent to the former alternative. Some satisfaction should be drawn from the knowledge that every yard of rock removed is a permanent improvement, and that the work is now at its most annoying stage, therefore, as the dredges advance westward they will be less and less in the way. I wish that representatives of the Lake Carrier's Association would meet me at the 'Sault' and examine the situation for themselves. I feel confident that they would concur in all that we have done, or propose to do."

In answer to this letter of explanation from Gen. Poe, the association decided to thank him for the care he has given the matter and for his prompt action in removing the obstruction which the Owen and the Maytham struck. In regard to the suggestion about appointing a committee, it was decided to inform Gen. Poe that the association did not consider such action at all necessary or desirable, preferring to leave the matter in his hands.

Handling Charges.

The flat condition of freights has again caused vessel owners to talk of making an effort to reduce the unloading charges on iron ore. Twenty cents for trimming and unloading out of a 50-cent freight from Escanaba is certainly a very heavy charge, but it is not probable that the dock companies will make a reduction unless very heavy pressure is brought to bear upon them, as any move in that direction would involve labor questions of importance.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company.....	$100 00	$.....	$.....
Champion Iron Company.....	25 00	.....	.....
Chandler Iron Company.....	25 00	.....	39 50
Jackson Iron Company.....	25 00	.....	75 00
Lake Superior Iron Company.....	25 00	.....	.....
Minnesota Iron Company.....	100 00	.....	60 00
Pittsburgh & Lake Angeline Iron Co.....	25 00	.....	125 00
Republic Iron Company.....	25 00	.....	9 25
Ashland	25 00	.....	.....
Section Thirty-three.....	25 00	.....	.....
Brotherton.....	25 00	.....	2 50
Iron Belt.....	25 00	.....	2 50
Aurora.....	25 00	.....	7 00

On the 6th inst. shipments of ore from Two Harbors were about equal to the movement from that port on the same date a year ago, the aggregate being 317,669 gross tons, divided as follows: Chandler 159,410 tons, Minnesota 136,547, Canton 12,942, Cincinnati 8,770. Two Harbors is, however, the only ore shipping port from which the movement will bear comparison with that of last season. Shipments from Ashland on July 2nd ammounted to 431,465 tons, divided as follows: Ashland 26,465 tons, Aurora 72,486, Colby No. 2 5,129, Tilden 43,397, Iron Belt 5,836, Montreal, south vein 1,347, Montreal, north vein 16,576, Brotherton 10,236, Comet 5,035, Carey, west 16,710, East Norrie 21,-621, Eureka 11,837, Newport 28,254, Norrie 87,796, Pabst 61,341, Superior 3,140, Sunday Lake 15,359, Davis 2,032.

The Ashland mine is another big Gogebic range property that has suspended all mining operations. The mine is employing less than fifty men all told in some exploratory work and in caring for shipments from the stock piles on a limited amount of ore that has been sold. The Minnesota company has suspended all work at the Canton, the new Missabe mine from which a big product was expected, About 12,000 tons had been shipped when work was stopped.

Although mining work of all kinds has been suspended at Champion mine, the management is urging the completion of machinery for crushing the very large quantity of ore in stock piles.

In General.

Findings of the army court of inquiry in the case of Col. William Ludlow have been taken from the treasury department to the war department, where it is expected they will be acted upon shortly.

One of the rooms of the press bureau at the World's Columbian Exposition has its walls entirely papered with title pages of leading publications from all over the world. These publications include daily papers, religious and trade papers, magazines, etc. Every nation and nearly every colony in every part of the world is represented.

Shipowners may ignore shipbrokers and now and then save a little commission. But whether this is politic or not is another question. A shipbroker's lot is not a happy one and he generally works hard for what commission he gets. Like every other sensible man in business he studies the interests of those who trust their affairs to him and they are gainers in the end, even though they forego saving a commission by having a broker.—Maritime Register.

The largest check ever sent to a ship building firm in this country for the construction of a naval vessel was made out June 20 in favor of the Cramps for $700,000, in payment of work on the New York. It includes the bonus of $200,000 which the company won by exceeding the contract speed by one knot. This premium is the largest yet paid on any naval ship constructed for the government, and was at the rate of $50,000 for each quarter knot over the twenty required of the cruiser.

In discussing the Camperdown-Victoria collision, Chief Constructor Hichborn, U. S. N., said: "The Camperdown has a weight of 10,600 tons and was moving at a rate of ten knots per hour or 16.88 feet per second. This would give an impact of 46,900 foot-tons delivered by the sharp ram of the Camperdown. That is equivalent to the blow that would be struck by a railroad train consisting of six large Pullman cars drawn by the heaviest of locomotives—say one of 120 tons, running at a speed of 50 miles per hour."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Chicago Office, Western Union Building, 706 Phoenix Building.
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,657 vessels, of 1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was, on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels	1,226	319,617.61
Canal boats	731	75,580 50
Barges	69	25,321.12
Total	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
Total	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

A LETTER from Mr. E. C. O'Brien, commissioner of navigation, notifies members of the Lake Carriers' Association that a bill dealing with wrecked vessels, derelicts and other menaces to navigation in the navigable waters of the United States, will be offered at the opening of the next Congress, and that a draft of the same will be submitted to the association for its consideration and approval. This measure, when introduced, will be deserving of earnest consideration from the association. Several instances of annoyance and danger from delay in removing abandoned sunken wrecks, and from a want of funds to place lights over sunken vessels which owners were slow in removing, have occurred on the lakes within the past few years. The statutes now provide "that all wrecks of vessels and other obstructions to the navigation of any port, roadstead, harbor, or navigable river, or other navigable waters of the United States, which may have been permitted by the owners thereof or the parties by whom they were caused to remain to the injury of commerce and navigation for a longer period than two months, shall be subject to be broken up and removed by the secretary of war, without liability for any damage to the owners of the same." In pursuance of work of this kind, however, the war department encounters delay in advertising for bids from wrecking companies and in other red tape methods that should be overcome by a law that will permit of immediate action. In the case of wrecked vessels afloat and permanently abandoned, commonly designated derelicts, there is no provision of law authorizing any officer of the government to destroy them. However it appears to be the practice of the navy department, when its attention is called to such wrecks or derelicts as being a menace to navigation, and on becoming satisfied that the government will not be liable for damages, to blow such wreck or derelict up. But in this regard also the absence of full authority of law is the cause of vexatious delays, and the commissioner of navigation will do the shipping interests a great favor if he can secure the passage of a bill that will overcome the present delay in removing obstructions from navigable waterways.

AN international question has again arisen over the work of dredging one section of the 20-foot channel. Collector Gott of Amberstburg, Ont., has refused to allow the contractors on the Bar point section, Messrs. L. P. & J. A. Smith of Cleveland, to operate their dredges on a large part of the work contemplated in the vicinity of Bar point and Bois Blanc island, near the mouth of the Detroit river, threatening them with seizure if his orders are violated. It has been hinted that the contractors, who took the job at a low figure, prompted this action on the part of the Canadian collector, but Mr. L. P. Smith denies this charge and says that his firm is ready, notwithstanding the small margin of profit, to push work on the contract, if Gen. Poe will make arrangements that will permit of dredging in the disputed portion of the channel, and thus give steady employment to the dredges. Although it is generally admitted that a portion of the Lime-Kilns crossing in this same locality is in Canadian waters, no such question as that now brought up was heard while the improvements at the crossing were under way. Gen. Poe is fully informed on all matters pertaining to the present difficulty, but he has not answered the reports of the contractors regarding the action of the Canadian collector at Amherstburg, and it is not known whether the war department has considered the conditions of enough importance to take up the subject with the Canadian government.

OWNERS and masters of vessels who depend largely upon newspaper reports in keeping a record of passages, arrivals, departures, etc. should render all possible assistance in having correct reports. The newspapers spend thousands of dollars in furnishing this information. Just now the only complaint from the Lake Marine News Association of Chicago, which has this work in charge, is in regard to passages at Mackinaw, where some masters render no assistance at all in having their boats reported. In most cases where vessels are missed at Mackinaw the fault is with the captains, who take the north passage and do not display burgees. Vessels running from the head of Lake Superior to Chicago gain a few miles in taking the north passage, but there is no good reason for this course being followed by vessels in the Lake Michigan trade, and in all cases masters should run as close to the point as possible.

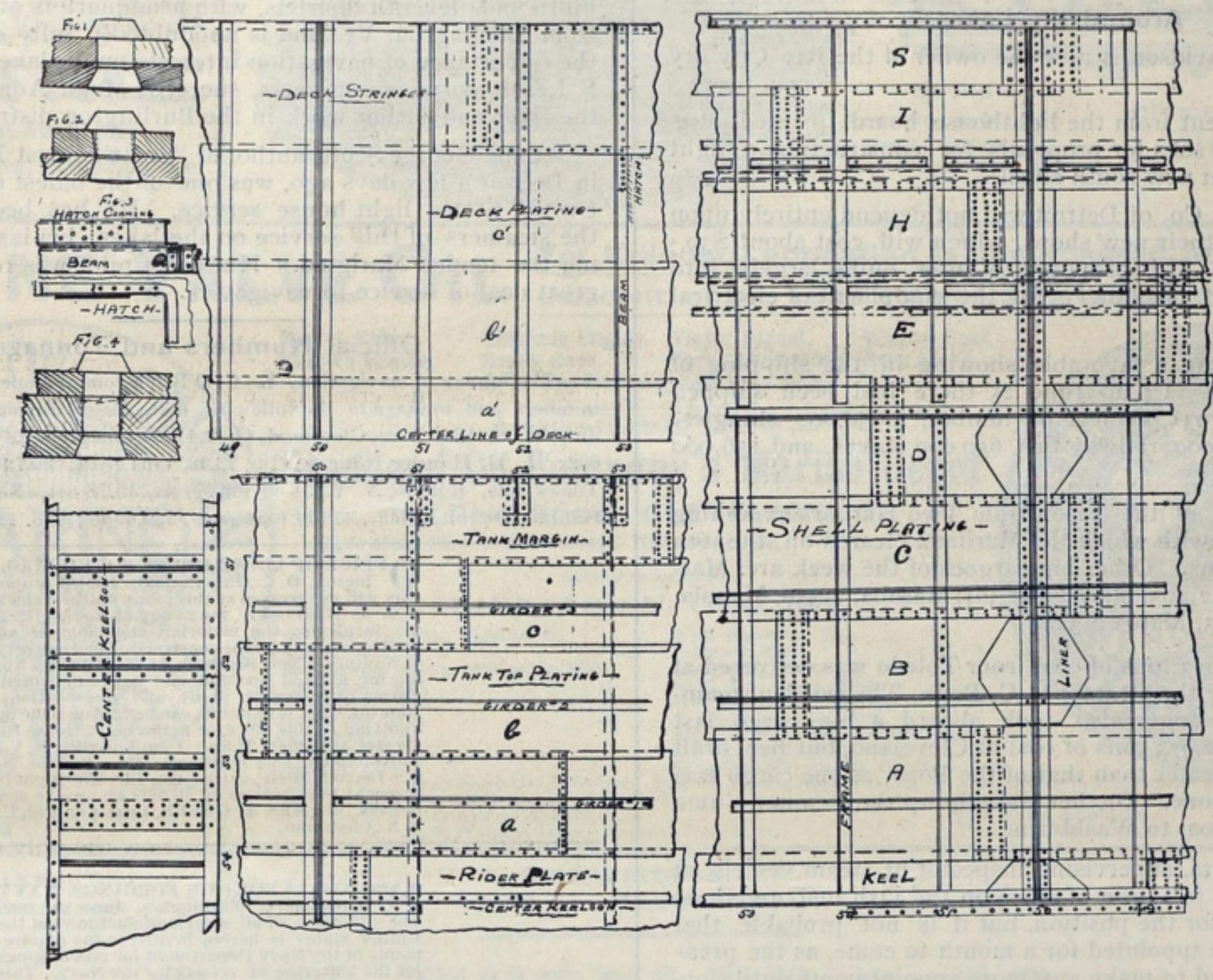
FIFTEEN people who were injured at Cold Spring, Long island, in 1891, sued the Miners' Excursion Navigation Company for $200,000. The defendant claimed that the suits could not be maintained, as the barge upon which the injured ones were at the time of the accident was only worth $2,500, and that the statutes limit the sum they could recover to the worth of the vessel. The plaintiffs held that as this vessel was not seaworthy, and was propelled by another vessel, the case did not come under the statute. Judge Benedict of the United States district court, Brooklyn, N. Y., decided that this point was well taken, and ruled that the plaintiffs could recover also to the amount of the towing vessel, which was worth about $10,000.

MR. WATSON, editor of the Engineer of New York, makes passing reference to an item about excessive vibration in two or three lake steamers, which appeared recently in the REVIEW. "A very common cause of vibration," he says, "is unbalanced screws. Very little attention is paid to this by engine builders. As a rule not one screw in 100 is balanced in the shop; a running balance, not a static balance, is what we refer to. Centrifugal force increases as the square of the velocity, and a wheel that is only 100 pounds out of balance develops a tremendous centrifugal force at seventy-six revolutions per minute. We have known many instances where vibration was cured by balancing."

Steel Ship Construction.—Part IV.

STRENGTH OF RIVETED SECTION OF VESSEL.

This mode of fracture depends upon the shift of the butts of the shell plating and the different parts of the structure which aid the vessel in resisting a tendency to part in two. The plan shows a diagonal shift of butts, and the rivets are sheared where the rivet holes are marked. Considering the resistance by friction, 9 tons is taken for the shearing strain of a ¾-inch rivet and 6 tons for a ⅞-inch rivet. The tensile strength of a ¾-inch rivet is 10 tons. The following table gives the number of rivets, their value and the number of tons.



STEEL SHIP CONSTRUCTION—STRENGTH OF RIVETED SECTION.

NUMBER OF RIVETS IN SECTION.

PARTS OF THE STRUCTURE.	Number of Rivets.	Value of rivets in tons.	Number of tons.
Keel plate	146	9	1314
A strake, shell plating	184	9	1656
B " " "	144	9	1296
C " " "	298	9	2682
D " " "	170	9	1530
E " " "	340	9	3060
H " " "	148	9	1332
I " " "	114	9	1026
S " " "	262	9	2358
Center keelson	230	9	2070
a strake tank top plating	62	6	372
b " " " "	164	6	984
c " " " "	88	6	528
Rider plate " " "	128	9	1152
Margin and angle tank top plating	188	6	1692
Girders	108	10	1080
Side stringer	80	10	800
Deck stringer	262	9	2358
Hatch coaming, Fig.3	20	9	180
" carling, a Fig. 3	8	10	80
Total			27,550

The total number of tons of strength in this riveted section is 27,550, or 3,665.2 tons more than at unavoidable weakest section. In this calculation there is a hatch at No.53 beam, which still increases the strength of the riveted section over plating. The area of the deck plating from stringer to stringer is 67 square inches, or 2,010 tons, so that by deducting 2,010 tons f om the punched material the difference in favor of the rivets is 5,675.2 tons. The punched material from stringer to stringer, minus coaming and carling, is 60 square inches, or 1,800 tons. Thus the riveted section is 1,416.7 tons stronger than the part between beams. To gain this result the rivet holes must be properly filled and the rivets on the point of shearing, as shown by Fig. 1. Fig. 2 shows a conical rivet, which should be used when the rivet hole is larger in the bottom than at top. Fig. 4 shows three thicknesses of plating. The dotted line *a* is larger on one side than on the other, caused by punching the plate with a large die. This middle plate should be punched a size less and rimed after the other two plates are in place, as by doing so bad work is prevented. Should the practice of punching the middle plate the same size as the top and bottom plate be continued, the narrow part of the hole will be unfair, and after it is rimed it will be oval and never on the point of shearing. It is not unreasonable to think that steel rivets should be used in steel plates, but the data given will show that there is no need of it, as the riveted part of the vessel is stronger than the unpunched material.

Grain Moving by the Canadian Canal Route.

Special Correspondence to the MARINE REVIEW.

KINGSTON, ONT., July 13.—The lack of despatch at Montreal, through the absence of ocean liners, has caused great delay to vessels at this port, and the boats that have been detained here will ask for demurrage. The need of an elevator is strongly felt, and the agitation for one, which was begun some time ago, is still going on, the government being pressed to provide the site. The amount of grain handled this year eclipses anything known. Every barge that can be chartered is now in use, the Garden island fleet of timber vessels being pressed into service. It is reported here that millions of bushels are still in Chicago to come here, while various cargoes of grain billed to Buffalo have been sent on here the lower rates of canal freights causing the change.

The people of Chatham are taken up with the scheme by which it is proposed to transport loaded cars on steamers from Cleveland to Rondeau harbor, connecting there with the Erie & Huron Railway Company. By this scheme it is expected that direct access will be had with the central states and that the double handling of coal, fish, lumber and minerals will be obviated. The people of the western peninsula are very anxious that the scheme be carried out, but it is a somewhat doubtful enterprise.

The steamer Empire State made a record last week. She started from Clayton, N. Y., with 300 passengers and landed them in Montreal—180 miles—in one hour and thirteen minutes better than any other steamer has covered the same distance. Folger Bros., the owners, claim she is the swiftest steamer on the St. Lawrence river.

The Canadian General Electric Company has sent forward from this city the necessary plant for the Beauharnois canal, to be used in opening and shutting the lock gates. The system, if successful, will be introduced on all the Canadian canals.

Another Lake Superior Record Broken.

The Eddy Transportation Company's steamer Selwyn Eddy is on her way down from Marquette to Buffalo with 3,322 gross, or 3,721 net tons of ore. This is the largest cargo ever carried through the St. Mary's Falls canal. On Aug. 18 of last year the Minnesota Company's steamer Maritana loaded 3,220 gross tons at Two Harbors, but her cargoes this season are very much below that figure.

Around the Lakes.

Capt. James Davidson is now the owner of the Bay City dry dock.

An advertisement from the lighthouse board, printed elsewhere in this issue, asks for proposals for constructing a light vessel for Nantucket new south shoal.

S. F. Hodge & Co. of Detroit will not depend entirely upon marine work when their new shops, which will cost about $30,000, are completed. It is proposed to enter quite largely into the construction of machinery for the equipment of electrical plants.

Alpena is making a favorable showing in the shipping of lumber this season. Up to June 25 there had been shipped from that port 41,031,000 feet of lumber, 4,950,000 shingles, 2,626,000 lath, 209,000 railway ties, 650,000 staves, and 156,000 cedar posts.

The first cargo of the season from Two Harbors exceeding 3,000 tons was that with which the Maritana cleared on the 6th inst., 3,023 gross tons. Other big cargoes of the week are: Mariposa, 2,920; Kirby ,2,405; Mariska; 2,361; Masaba, 2,330; Manola, 2,355; Maruba, 2,333, Matoa 2,327.

A cargo of 3,013 tons of coal from Toledo was delivered at Duluth last week by the steamer E. C. Pope. The wooden steamer Ferdinand Schlesinger also took aboard a big cargo last week. She loaded 2,973 tons of coal at Cleveland, but her draft was, of course, greater than that of the Pope, as the cargo was consigned to Gladstone. On her last trip up the steamer Yuma took 3,247 tons of coal to Washburn.

Alex. McMasters, supervising inspector of steam vessels at Buffalo, finished his full term of office on the 11th inst. and there are four applicants for the position, but it is not probable that his successor will be appointed for a month to come, as the president does not intend to make any more appointments until Congress convenes. The applicants for the position are ex-Supervising Inspector W. D. Robinson, John M. Laughlin, Theodore M. Moore, Charles J. Clarke and William Dixon, all of Buffalo.

Gen. Poe has just sent on to Washington a report covering the operation and care of St. Mary's Falls canal during the fiscal year ending June 30, 1893. The report is interesting, but from a statistical standpoint is of minor importance, as it covers four months of navigation in 1892 and the three early months in 1893, instead of one full seasons business as shown by the statistical report made up during the winter months at the canal office. This report for the full season of 1892 was published in the REVIEW several weeks ago.

Trade Notes.

The Berlin Iron Bridge Company, of East Berlin, Conn., has received from E. D. Leavitt, consulting engineer of the Calumet and Hecla Mining Company, a contract for the iron roof over the company's new engine house. The building will be 80 feet wide and 200 feet long.

The American Ship Masters' Association of New York, publishers of the Record of American and Foreign Shipping classed last week the American barks Lillian and Obed Baxter and American three-masted schooner Sadie Willcutt.

John A. McConnell & Co., a Pittsburg firm now represented in Cleveland by William T. Johnson, who has an office at No. 26 So. Water street, are among the largest dealers in asbestos goods in this country. This company's manufacturing department was recently consolidated with the McConnell Asbestos Company Limited, and the McConnell Asbestos Mining Company.

At the shipyard of the American Steel Barge Company, West Superior, Wis., where a new whaleback was turned out about every month for the past three years, work has been entirely suspended.

Personal Mention.

Mr. Sinclair Stewart, surveyor for the Standard Register of Shipping, New York, who was in Cleveland a few days ago on his way up the lakes, made arrangements with Capt. John Mitchell to classify the steel boat building for the Hopkins Transportation Company at West Bay City.

Major. M. B. Adams, corps of engineers, U. S. A., who has just been assigned to the duties of light-house engineer in the ninth and eleventh districts, with headquarters at Detroit, comes from Burlington, Vt., and is undoubtedly fully acquainted with the importance of navigation interests on the lakes. Capt. Smith S. Leach, corps of engineers, succeeds Major Adams in charge of the river and harbor work in the Burlington district.

Capt. George Scott, author of "Scott's Coast Pilot," who died in Detroit a few days ago, was one of the oldest employes in the United States light house service. He has been in charge of the steamers of this service on the lakes, his last command being the tender Marigold. His coast pilot was reliable and of a great deal of service to navigators.

Official Numbers and Tonnage.

The bureau of navigation, E. C O'Brien commissioner, assigned official numbers and tonnage to the following lake vessels during the week ending July 1: Steam—Alva, Cleveland, O., 2,419.98 tons gross, 2,000.92 net, No. 107,032; M. G. Hansler, Chicago, Ill., 73.43 tons gross, 36.72 net, No. 92,524; Tonawanda, Buffalo, N. Y., 31.56 tons gross, 15.78 net, No. 145,645. Sail—Schilde, Detroit, Mich., 338.14 tons gross, 329.69 net, No. 116,578.

OFFICE OF LIGHT-HOUSE BOARD, Washington, D. C., July 15, 1893. Sealed proposals will be received at this office until 2 o'clock p. m. on Wednesday, the 2d day of August, 1893, for furnishing the materials and labor of all kinds necessary for the construction and delivery of Nantucket New South Shoal Light Vessel No. 58, for a fixed sum for said vessel delivered. Forms of proposals, plans, and specifications, showing what is required, can be had or seen by applying to this office, or to the Light-House Inspector at Boston, Mass.; Tompkinsville, N. Y.; Philadelphia, Pa.; Baltimore, Md.; Buffalo, N. Y.; Detroit, Mich., or Chicago, Ill. The right is reserved to reject any or all bids and waive any defects. JAMES A. GREER, Rear-Admiral, U. S. N., Chairman. 13

PROPOSALS FOR GUN FORGINGS. NAVY Department, Washington, June 29, 1893. The attention of all steel manufacturers of the United States is hereby invited to the requirements of the Navy Department for gun forgings for the batteries of vessels for the Navy. This advertisement invites all domestic manufacturers of steel to specify, in competition with each other, upon what terms they will engage to produce the gun forgings herein mentioned, and no bids will be considered except such as engage to produce within the United States, of domestic material, the gun steel mentioned in this advertisement, nor will any bids be accepted unless accompanied by evidence satisfactory to the Department that the bidder is in possession of a plant adequate for its fulfillment. Bids are hereby invited for furnishing the Department the following material: Forty sets of rough-bored and turned forgings for 4-inch breech-loading rifles. Thirty sets of rough-bored and turned forgings for 5-inch breech-loading rifles. Sixteen sets of rough-bored and turned forgings for 8-inch breech-loading rifles. Five sets of rough-bored and turned forgings for 12-inch breech-loading rifles. One set of rough-bored and turned forgings for 3-inch breech-loading rifle. For information concerning shapes and weights of the gun forgings, the specifications governing the manufacture and the tests for acceptance of the same, and for all other particulars, apply to the Chief of Bureau of Ordnance, Navy Department, Washington, D. C. Proposals must be in duplicate, sealed and addressed to the Secretary of the Navy, Navy Department, Washington, D.C., the envelopes endorsed "Proposals for gun forgings." They will be received at the Navy Department until 12 o'clock m. on the 18th day of July, 1893, at which hour the opening of the bids will take place. Each proposal must be accompanied by a certified check, payable to the order of the Secretary of the Navy, for an amount equal to five per cent. of the bid. The check received from the successful bidder will be returned to him on his entering into a formal contract for the due performance of the work and giving bond for the same, with security to the satisfaction of the Secretary of the Navy, in a penal sum equal to 15 per cent. of the amount of his bid; but in case he shall fail to enter into such contract and to give such bond within thirty days after notice of the acceptance of his proposal, the check accompanying such proposal shall become the property of the United States. All checks accompanying proposals which are not accepted will be returned immediately after the award shall have been made. The right is reserved to waive defects in the form of, and to reject any or all bids. Ten per cent. will be retained from payments under the contract on each class of forgings until completion thereof and compliance with the specifications. Preference will be given for early deliveries, and a penalty will be imposed for failure to deliver the forgings within the time specified in the contract. H. A. HERBERT, Secretary of the Navy. 6-13

PATENTS.

FRANK L. DYER,
918 F. Street,
Washington, D. C.

References: American Steel Barge Co.; Capt. Alexander McDougall.

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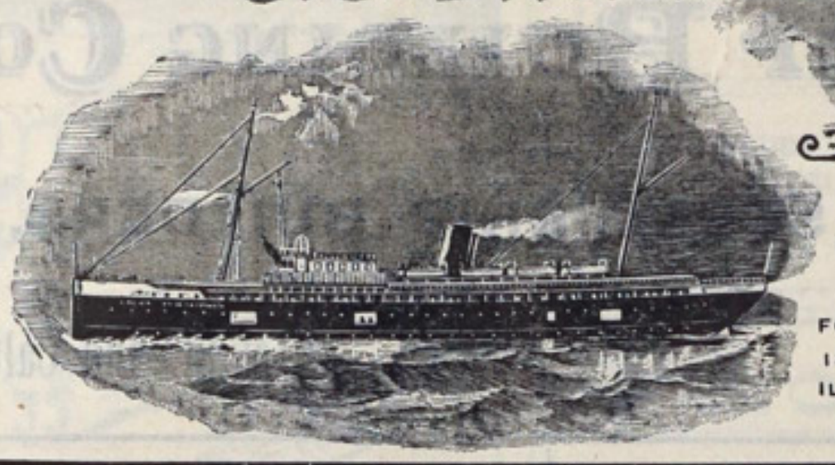

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46 Jefferson, Detroit, Mich.
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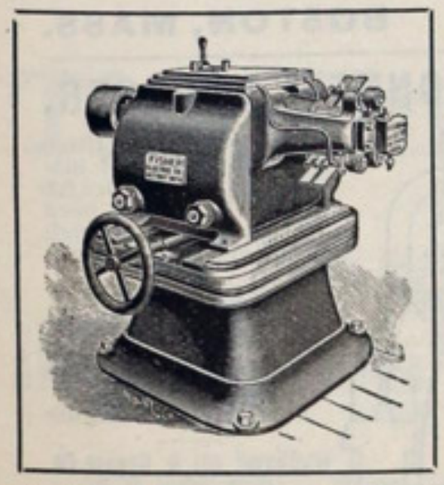

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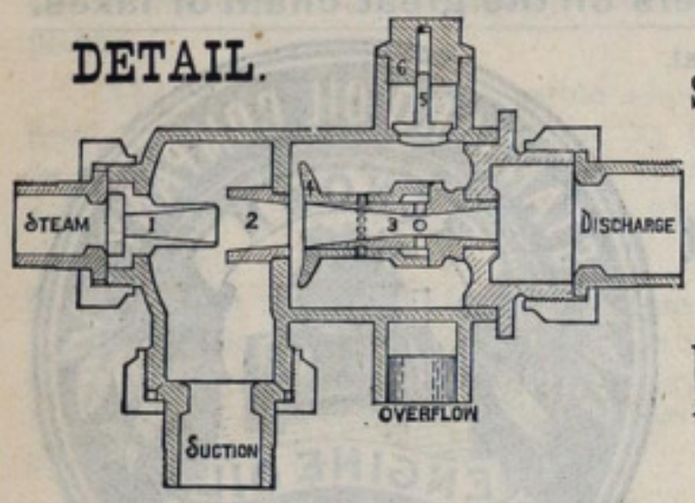

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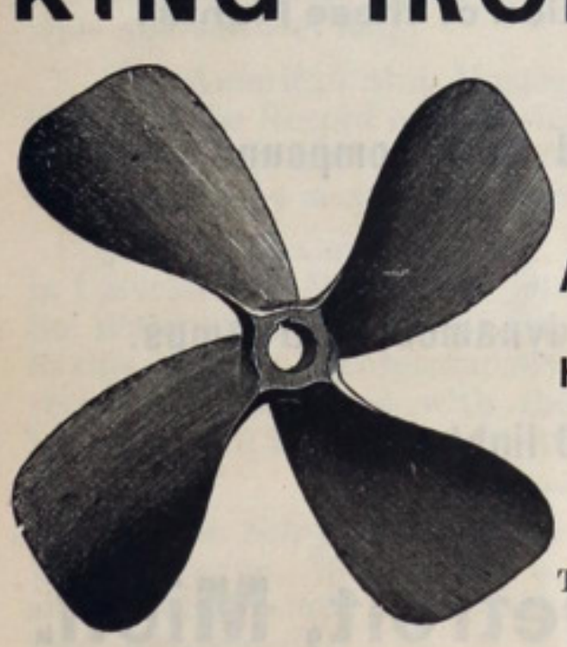

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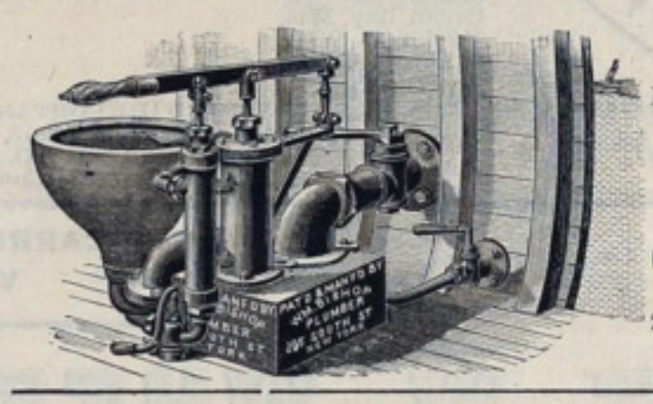

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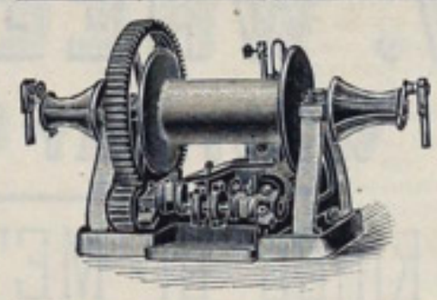

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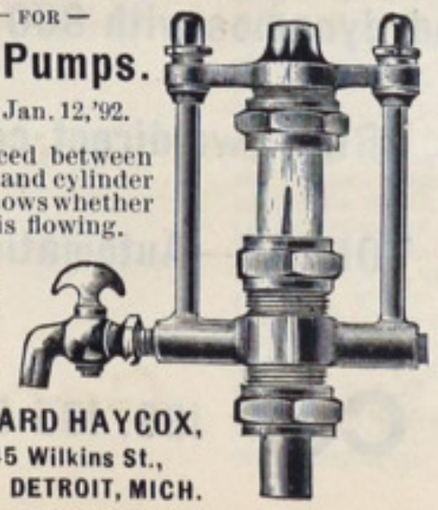

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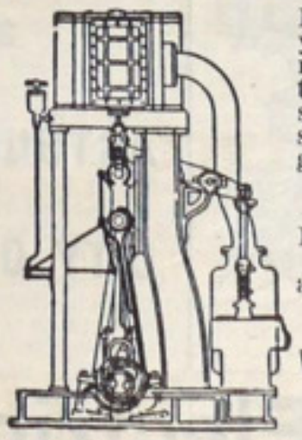

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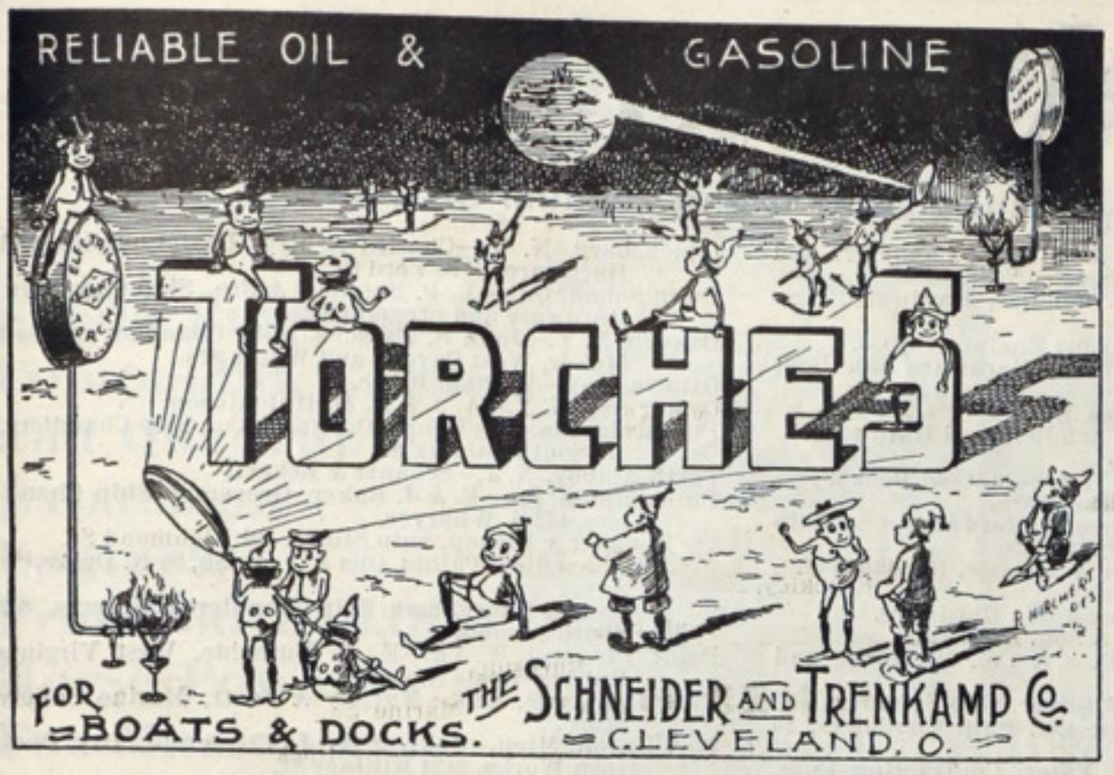

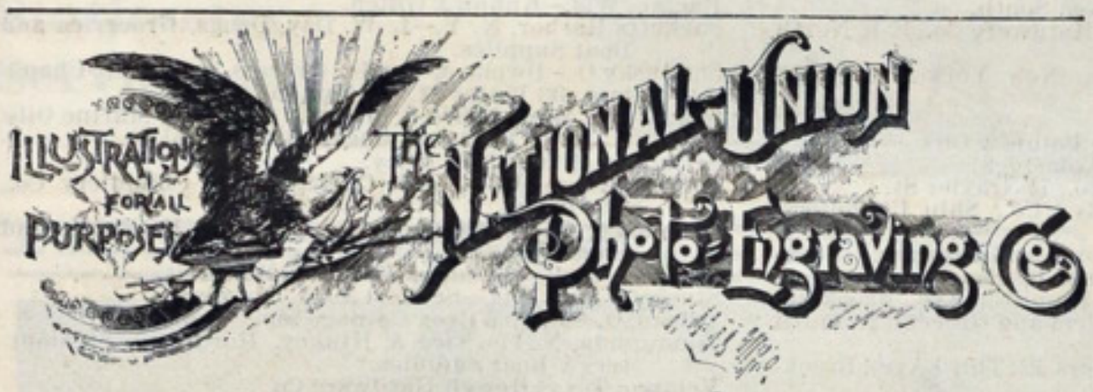

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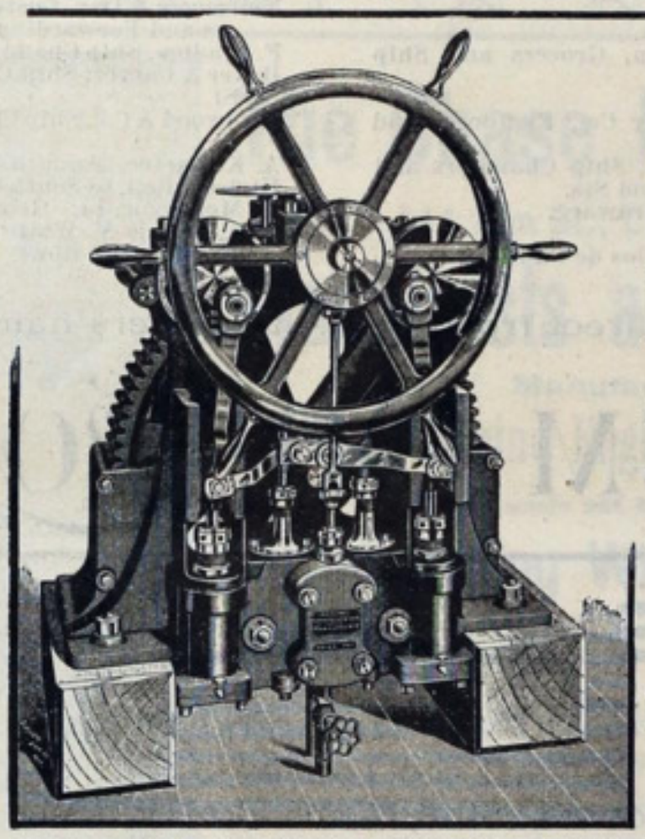

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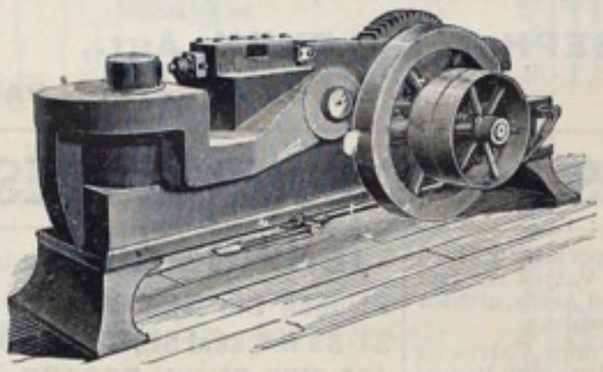

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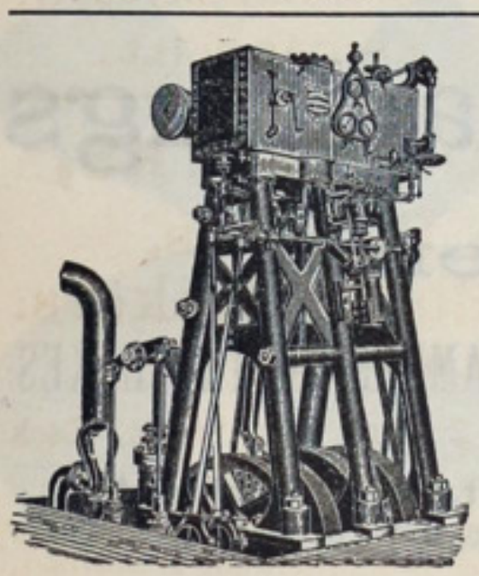

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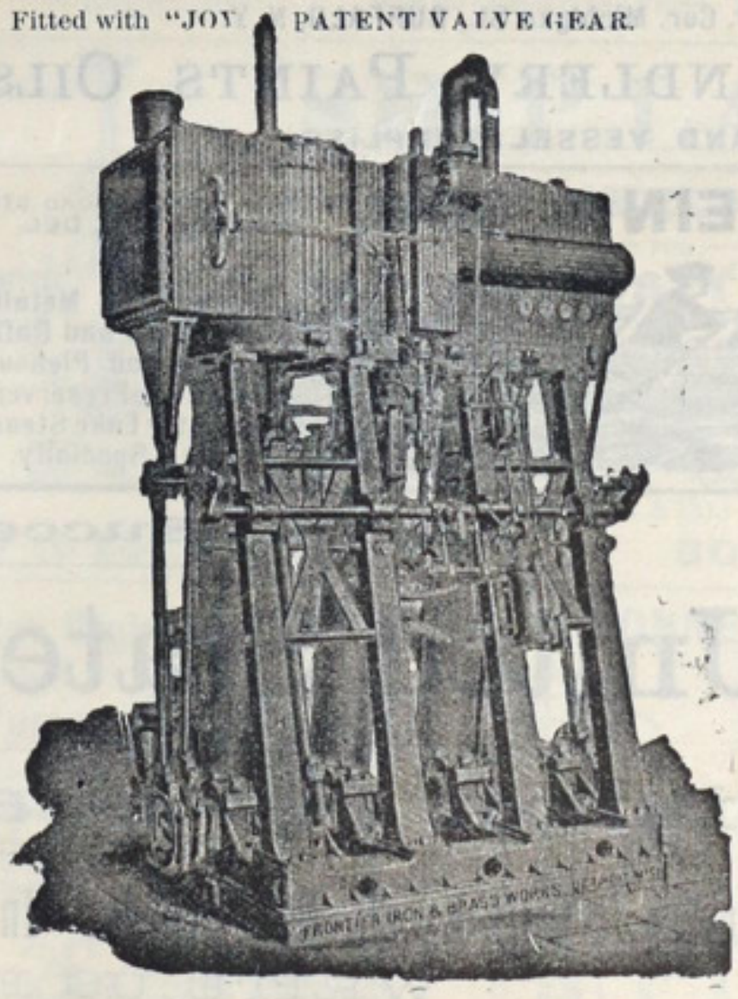

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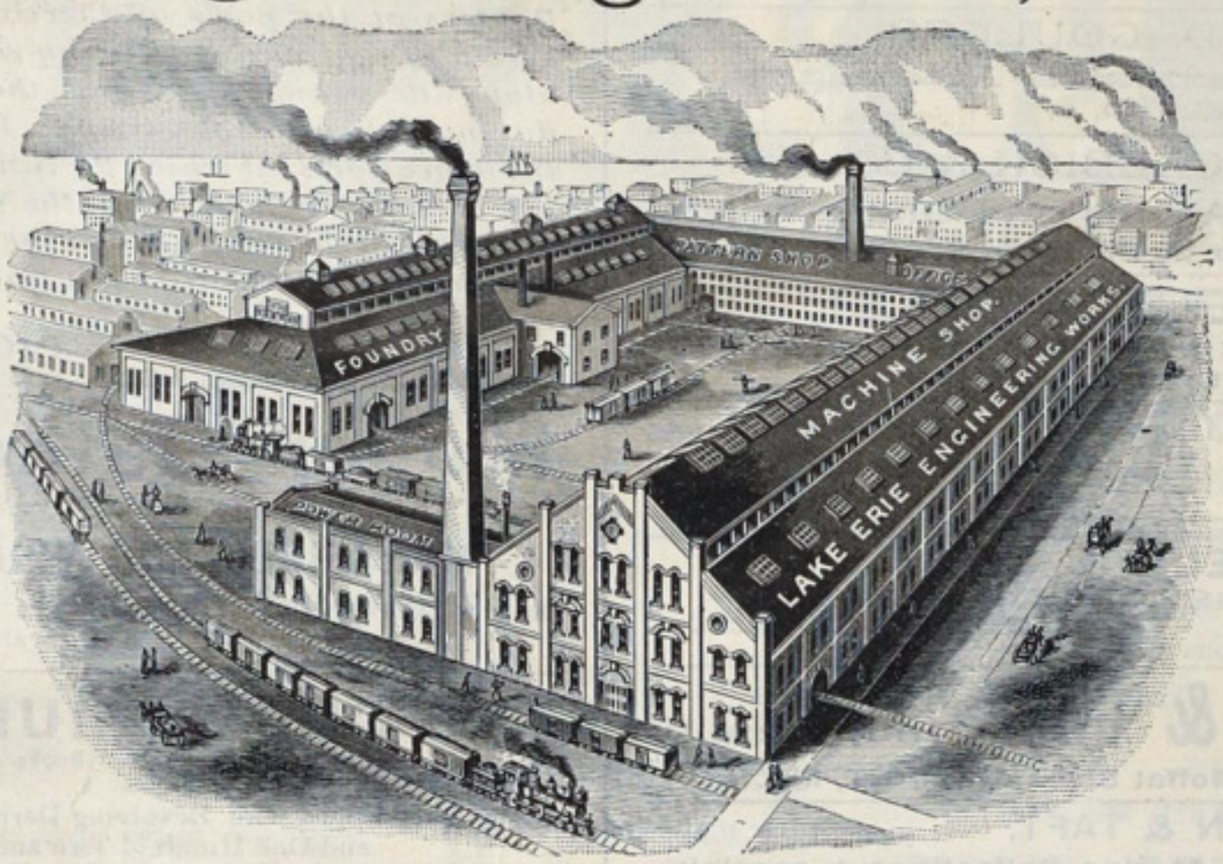

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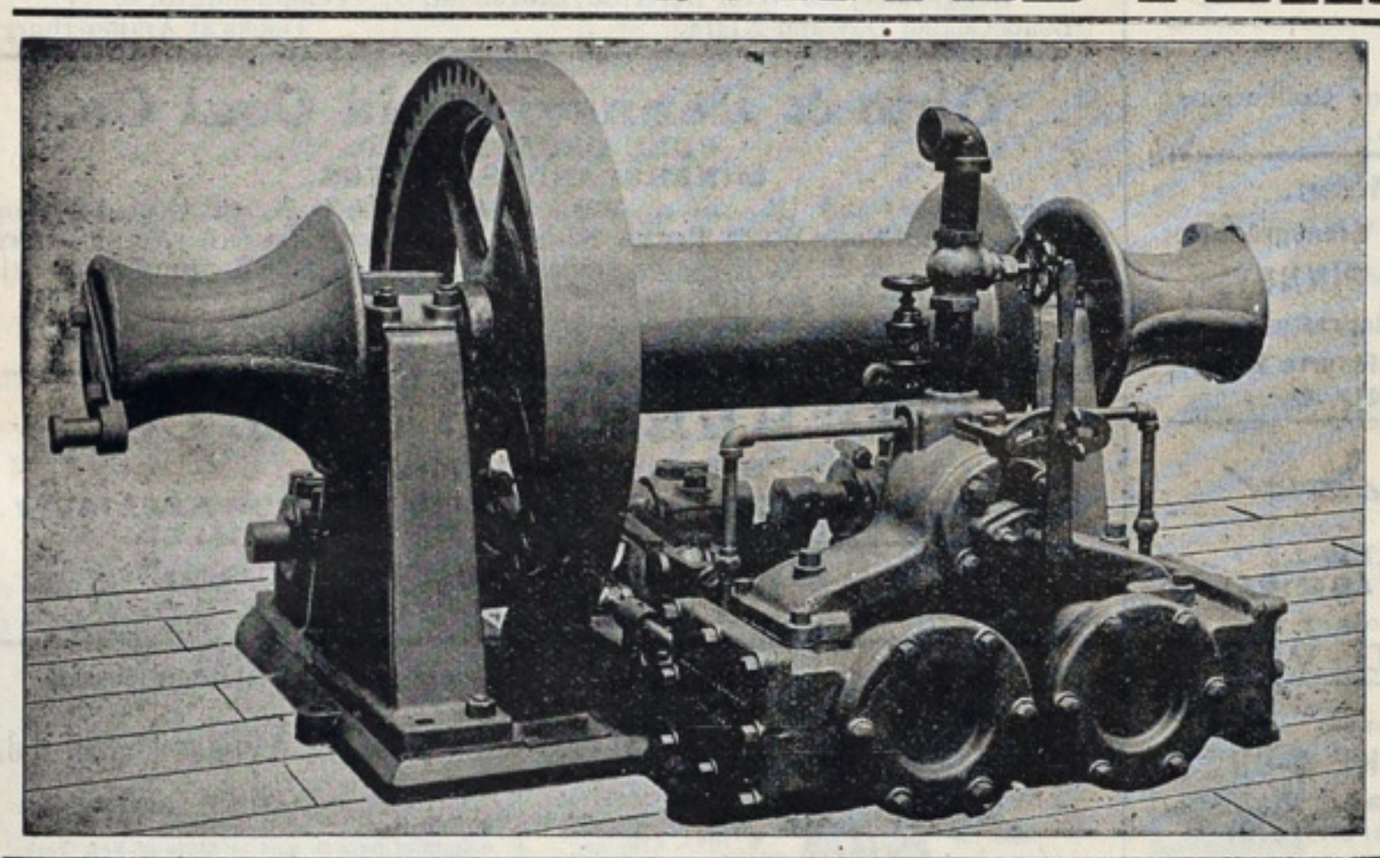

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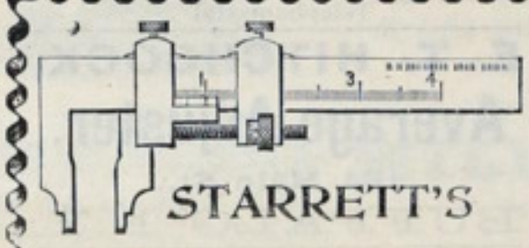

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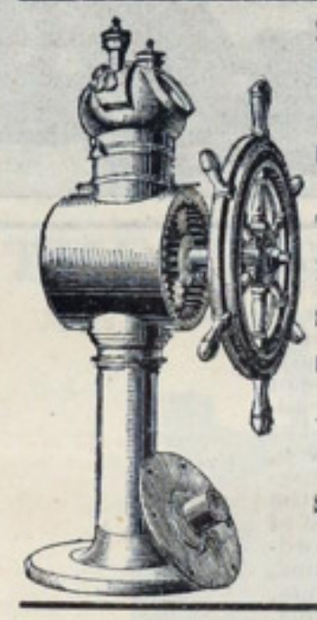

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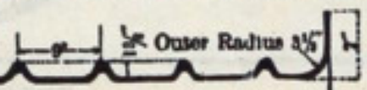

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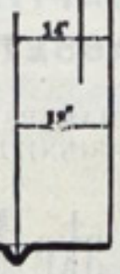

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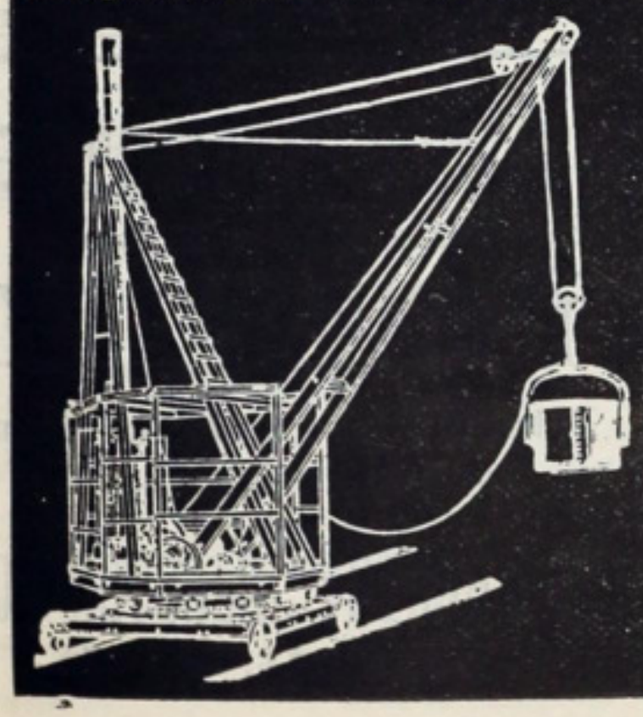

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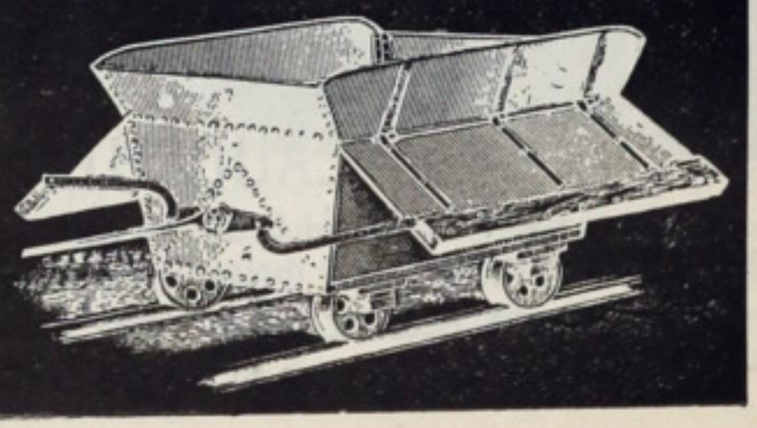

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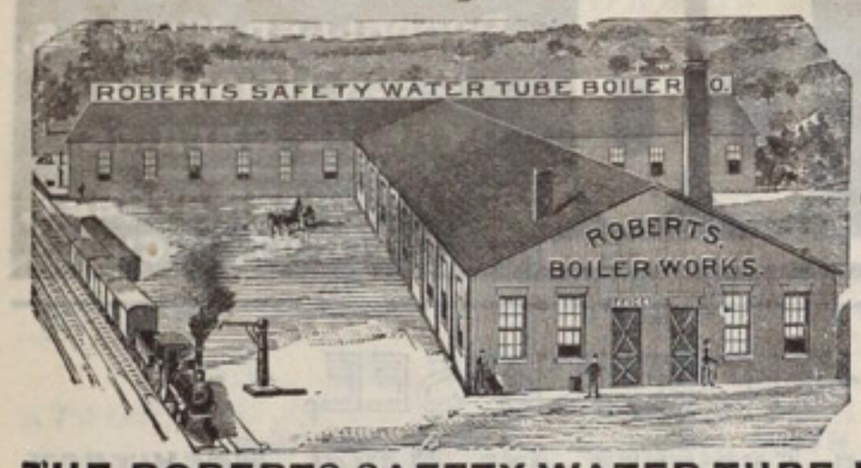

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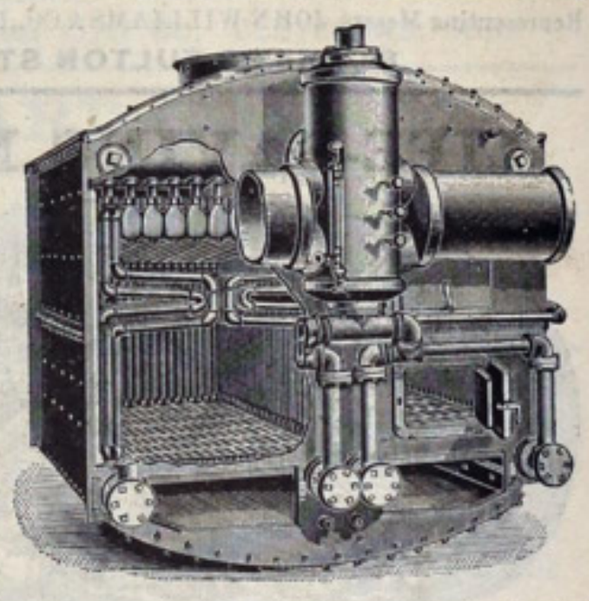

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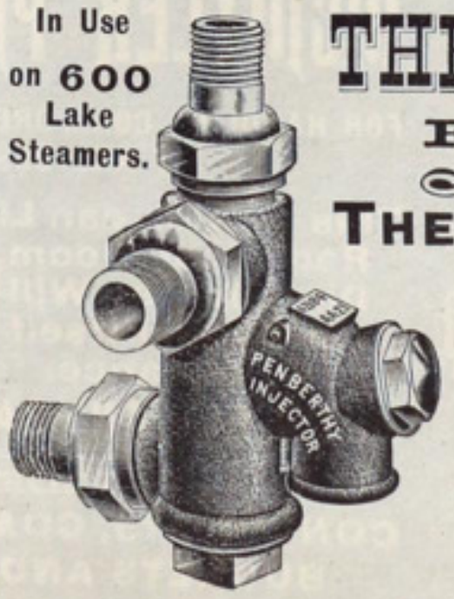

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